GSAPS THE SUMMARY OF DOCTORAL THESIS
Impact of ICT on Economic Development:
A Case Study of Thailand

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Information and communication technology (ICT) has become one of the key instruments to achieve economic development. The world has witnessed a number of examples when the usage of ICT produces favourable economic outcomes. This thesis emphasises the benefits of ICT; hence, attempts to provide more detailed analyses of desirable economic outcomes of ICT in developing countries. Thailand is selected as ground of investigation. This country is a developing country in which the usage of ICT has gained a great deal of popularity from both public and private sector. However, there are issues to be handled in order to understand the expected economic outcomes and characteristics of ICT usage that will lead to economic prosperity.

First, most of the Thai firms with ICT usage exhibit a higher level of labour productivity compared to those with low or without ICT usage. Nonetheless, the issue is that it is not clear whether it is just a mere correlation, or the ICT usage actually causes the improvement of labour productivity. Second, the usage of innovative ICT services has shown a positive and desirable impact in developed economies. The issue is that it has not been analysed whether such advanced ICT services are also associated with preferable economic outcomes in Thailand. Third, in order to reach sustainable economic development from ICT, the adoption should be promoted. Thus, the last issue is that the country needs an effective means of the promotion of ICT utilisation among all businesses and individuals.

To tackle all the aforementioned issues, the objectives of this thesis are divided into two parts, namely (1) to analyse the economic impact of telecommunications on a developing country and (2) to provide implications for the promotion of ICT adoption among businesses and individuals. There are six research questions of which the first three correspond with the first part, while the last three handle the second part of the objectives.

The underlying research questions are (1) does ICT utilisation lead to the improvement of labour productivity?; (2) is the potential adoption of cloud computing-based services associated with prospective macroeconomic benefits?; (3) does the usage of cloud computing-based services deliver a favourable economic impact to industries?; (4) what are the determinants of potential adoption of cloud computing-based services among industries?; (5) what are the determinants of mobile carrier switching?; and (6) what are the components of switching barrier and switching driver? Each research question is responded by a case study. All six case studies are categorised into macroeconomic and microeconomic analysis in order to provide a comprehensive flow of thesis arrangement.

For literature review, Colecchia and Schreyer (2002) concluded that there is a positive impact of ICT investment on economic growth among nine OECD countries during 1990s. In terms of macroeconomic impact, Murphy (2002) found out that preferable organisational changes for firms can be achieved at a faster pace with the use of ICT.

This thesis employs quantitative approach as the main research methodology. Nevertheless, there are some qualitative analyses to support the quantitative results. Statistical estimations are mainly used in each case study. The statistical models are based on two main economic theories. First, it is the growth accounting theory being used in the macroeconomic case study (Solow, 1956). This theory provides a fundamental for the firm’s production function used in this thesis. The Cobb-Douglas production function is used. For the macroeconomic case study, the national output is the aggregated output of the firm’s production function, while labour productivity is the national output divided by number of labour. Second, all macroeconomic case studies regarding ICT adoption are based on discrete choice theory. This is another economic theory taking into account random utility model (McFadden, 1973). According to the theory, the alternative providing a higher level of utility will be selected.

For practical purposes, all the theories are used to construct statistical models in order to perform estimations for the case studies. The statistical techniques consist of ordinary least squares (OLS) regression, bivariate autoregressive model (Granger causality test), vector autoregressive (VAR) model, binary logistic regression (binary logit), and confirmatory factor analysis (CFA).

The results can be divided into two parts. The first part responds to the first objective. This thesis provides empirical results showing that (1) ICT utilisation is the cause of the improvement in labour productivity; (2) the potential adoption of advanced ICT services – cloud services – associated with favourable economic outcomes of a higher level of national output, employment, and labour productivity; and (3) the relevant cloud services also yield a benefit to industries in terms of lower communication services expenditure in the short run and lower its usage intensity in the long run.

The second part, which responds to the second part of the objectives, shows that (4) the determinants of potential adoption of cloud services for industries are internet and technology factors, cost factors, and perceptions regarding ICT usage difficulties; (5) the determinants of mobile carrier switching are customer demographics, mobile services, and customer preferences; and (6) switching barrier consists of number retention and switching complications, while switching driver consists of cost saving, better service, better technology, and better signal.

From the empirical results, policy implications can be derived. First, public and private entities should join force to promote the consumption as well as investment in ICT in order to reach a higher labour productivity. Second, the usage of cloud services should be promoted in businesses as well as public organisations to save a part of ICT spending and to make efficient use of computing resources. Example policies include the development of reliable and hi-speed internet network. Third, to promote the usage of mobile services, the competition should be endorsed. In order to increase the competition, there should be policies or regulations to improve price competition apart from signal quality, technology, and customer service.

References